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REMARKS

Claims 1 to 97 are the pending claims being examined in the application, of which

Claims 1, 34, 39, 59 and 93 are independent. Reconsideration and further examination are

respectfully requested.

The Office Action contends that the U.S. Provisional Application No. 60/201,622 (the

'622 provisional) does not provide support for basing the generation of user log scores and

determining at least one result item so as to discover at least one relationship exclusively

detected user item selections. The Office Action also rejects Claims 1 to 33 and 39 to 92 under

35 U.S.C. § 112, first paragraph, alleging that the present application fails to provide a

description for these same elements.

Turning first to the matter of the '622 provisional, at page 2, the Office Action cites page

213 of the '622 provisional and states that the "provisional document teaches that the

recommendation engine utilizes both the explicit and observed behavior to provide

recommendation."

The cited portion of the '622 provisional concerns a recommendation engine, and making

a recommendation using the recommendation engine. Applicants agree that a recommendation

can be based on both explicit preferences and observed behavior. As is discussed below, a

recommendation engine can use explicit preferences and relationships discovered based on

observed behavior. The invention of the present claims concerns discovery of relationships

based on observed behavior. More particularly and with reference to Claim 1, for example, a

method of discovering relationships includes generating user log scores based exclusively on

detected user item selections, and determining at least one result item to discovery at least one

relationship based exclusively on detected user item selections and at least one query item. As is

discussed more fully below and in the '622 provisional, relationship discovery can be used in a

number of applications, including that of making recommendations based on discovered

relationships.

By way of a non-limiting example, reference is respectfully made to pages 301 to 305 of the '622 provisional. The referenced portion of the '622 provisional describes providing data structures such as inverted and forward index structures to store a record of listeners' musical selections. One example of such a data structure used to record listener selections described in the referenced portion of the '622 provisional is a multi-dimensional matrix comprising rows and columns, each row corresponding to a listener, each column corresponding to a particular item selection. As described at page 302, each cell in the matrix has a value that represents a number of times that an item is selected by the listener, e.g., a number of times a song is selected.

The referenced portion of the '622 provisional describes a number of "algorithms" for retrieving information from the matrix. As is described in the section entitled "Applications of the Algorithms" at page 304 of the '622 provisional, one or more of these algorithms can be used to discover relationships between songs, albums, and artists, for example. By way of a non-limiting example, one of the algorithms described in the section entitled "Retrieval by Columns" at page 303 of the '622 provisional, generates a score for a number of rows in the matrix to identify commonality between a query and rows of the matrix. As previously discussed herein, as is described in the referenced portion of the '622 provisional, each row in the matrix represents a listener and each cell value in a row represents an item and a number of times the item has been selected by the listener. As is described in this section at page 303 of the '622 provisional, a score for each row is generated based on the row's cell values and the query, so that a score for a listener's log is based on the listener's item selections and at least one query item, and can be used to identify matrix rows that have commonality with the query. As is described in the section entitled "Application of the Algorithm" at page 304 of the '622 provisional, the "retrieval by columns" operation, which is based on listener item selections and the query, is just one of the operations that can be used to discover relationships.

As is described in the '622 provisional, discovered relationships can be used in a number of ways. By way of non-limiting examples, as is described at page 304 of the '622 provisional, discovered relationships can be used for ad targeting, demographic and psychographic modeling, and for recommending items, e.g., recommending a program of songs likely to be enjoyed by a particular listener.

The foregoing provides one example of some of the portions of the '622 provisional which provide more than ample support for the claims of the present applications, and in particular the claim elements referenced in the Office Action, in compliance with 35 U.S.C. § 112, first paragraph. Based at least on the portions of the '622 provisional discussed herein, there is more than ample support for scoring user logs, the scoring being responsive to a degree of occurrence of the at least one query item identifier in the user logs, so as to generate user log scores based exclusively on detected user item selections and the at least one query item, and determining at least one item, responsive to a degree of occurrence in at least a subset of the scored user logs, so as to discover at least one relationship based exclusively on detected user item selections and a query including at least one query item identifier. The '622 provisional application provides more than ample support for the claimed subject matter, and entitles the present application to the May 3, 2000 priority filing date of the '622 provisional.

With reference to the 35 U.S.C. 112, first paragraph rejection of Claims 1 to 33 and 39 to 92, the Office Action identifies paragraphs 109, 113 to 115 and 117 (the paragraph numbering being that used in the application as filed), as alleged support for the position taken. The cited paragraphs are reproduced below in full with the portions of each identified in the Office Action set out in italics and underlined, together with paragraph 116:

> [0109] *Recommendation engine 107 provides suggestions for tracks and artists that are likely to appeal to a particular user.* Suggestions provided by engine 107 are presented via web site 106 in the form of web pages, or via jukebox 103, or by some other output means. *Recommendation engine 107 takes as input the user profile from profile database 112, as well as personal criteria database 111 containing demographic and other information describing the user. Thus, engine 107 uses a combination of explicit preferences and observed behavior to provide personalized music recommendations* at any desired level, including for example tracks, artists, albums, genres, and the like. Details of the operation of recommendation engine 107 are provided below.

> [0113] *In one embodiment, profile database 112 is augmented and enhanced by data from user feedback. When users listen to music tracks, they may be offered the opportunity to provide feedback as to whether they enjoyed the tracks, and as to their opinions on other tracks and artists. Such feedback is processed and stored in profile database 112 and may be used as a basis for future recommendations* provided by recommendation engine 107. In addition, such feedback may be used to generate and/or refine discovered relationships among artists and tracks.

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[0114] One advantage of the present invention is that it provides recommendations that are responsive to particular tastes and preferences of individuals, so as to enable implementation of a personalized radio station that presents music tracks likely to be enjoyed by the individual user. *As described below, the invention discovers relationships among artists and tracks in order to find musical selections that the user is likely to enjoy, based on observed behavior and profile information describing the user.* These relationships can further be employed to serve as a basis for delivery of advertising, improved searches, customized promotions and offers, and the like.

[0115] *The present invention develops detailed behavior profiles based on observed user listening behavior.* User track selections, made via jukebox 103, are monitored, along with user operations such as repeating, skipping, or scanning through tracks. Behavioral data is provided as input to a relationship discovery engine that operates as described herein. Relationship discovery takes place based on statistical analysis of track-to-track co-occurrences in observed user behavior. Recommendation engine 107 uses discovered relationships to generate suggestions of additional artists and tracks. User profiles, as stored in profile database 112, contain descriptions of analyzed play logs, as well as additional track suggestions related to the tracks the user has demonstrated he or she likes. Profiles can be modified, enhanced, or filtered, to include second- or third-level related artists or track, or to include only tracks the user does not already own. A randomization component may also be included in the development of profiles.

[0116] The architecture shown in FIGS. 1A and 16 may be used, for example, for implementing a personalized radio station that takes into account learned relationships among artists and/or tracks. Using the architecture of FIGS. 1A and 16, the system of the present invention learns relevant relationships, and populates a learned relationships database 1605 with the results. In one embodiment, the system acquires information from a deployed population of jukeboxes 103.

[0117] Referring again to FIGS. 1A and 16, *learned artist relationships 1605, along with user profiles describing characteristics of users, are provided to recommendation engine 107,* which operates as discussed above and transmits recommendations to radio sequence generator 1613, which is a component of radio sequence transmitter 121. Format definitions 1611, which includes descriptions of radio station formats (e.g. alternative rock, country/western, etc.), and other general constraints 1616 such as, for example, track schedules (e.g. play a top-40 hit at the top of each hour), are also provided to radio sequence generator 1613.

The Office Action concludes, at page 4, that the specification does not show that "scoring or recommendation or determining is done solely or exclusively on detected user item selection."

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The Office Action's conclusion appears to be based on an assumption that recommendation and relationship discovery are synonymous. As is described in the '622 provisional and the present application, in accordance with at least one disclosed embodiment, relationship discovery and recommendation generation are different at least with respect to the information used for each. Relationship discovery uses observed behavior as regards user item selections. In contrast, recommendation generation uses observed behavior and explicit input.

In accordance with at least one embodiment disclosed in the cited portions of the present application reproduced above, suggestions likely to appeal to a user are generated by recommendation engine 107 based on explicit preferences and observed behavior (see paragraph 109 above), while the relationship discovery engine 1604 uses observed behavior to discover relationships between items, such as tracks, artists, etc. (see paragraph 115 above). Furthermore, as is discussed in paragraph 114 and in the '622 provisional, the relationships discovered can be used for a number of applications, such as ad targeting, improved searching, demographic and psychographic modeling, customized promotions, as well as making recommendations. With regard to the latter, in an embodiment disclosed in paragraphs 109 and 114 to 117 of the present application, relationships are discovered among artists and tracks by relationship discovery engine 1604 based on analysis of track-to-track co-occurrences in observed user behavior. The relationships discovered by relationship discovery engine 1604 and profiles describing user characteristics are input to recommendation engine 107 so that recommendation engine 107 can find musical selections that a user is likely to enjoy based on behavior and profile information describing the user.

The invention of the present claims concerns relationship discovery including basing generation of user log scores and determining at least one result item so as to discover at least one relationship exclusively detected user item selections. It is clear from the cited portion of the present application that the disclosure of the present application provides more than ample support for the subject matter of the present claims. Furthermore, it is clear that the '622 provisional provides more than ample support entitling the present application to the May 3, 2000 filing date of the '622 provisional.

Based at least on the foregoing discussion, it should be apparent that the Application as originally filed provides more than adequate support for the amendments made herein. Reconsideration and withdrawal of the § 112, first paragraph rejection are therefore requested.

Turning to the rejection of the claims based on art, the Office Action appears to reiterate the rejection of the claims based on Hosken and Lazarus. More particularly, Claims 1, 4 to 27, 32, 33, 39, 42 to 59, 62 to 85, 91 and 92 are rejected under 35 U.S.C. §§ 102(e) and 103(a) over U.S. Patent No. 6,438,579 (Hosken), and Claims 2, 3, 28 to 31, 34 to 38, 40, 41, 60, 61, 86 to 90 and 93 to 97 are rejected under 35 U.S.C. § 103(a) over Hosken and U.S. Patent No. 6,438,579 (Lazarus).

As discussed above, the disclosure of the '622 provisional provides more than ample support for the invention of the present claims, and establishes a priority date for the present application of May 3, 2000, which predates the Hosken's July 14, 2000 filing date. It is clear that Hosken can only be prior art by relying on the filing date of U.S. Provisional Application No. 60/144,377 (Hosken '377), and Hosken '377 can only be relied on for its filing date if it provides full support, in compliance with 35 U.S.C. § 112, for the subject matter of Hosken relied-upon in the Office Action. See MPEP § 2136.03 (III). From a review of Hosken and Hosken '377, there are significant portions of Hosken relied on in the Office Action which can not be found in Hosken '377, to name some of the portions, for example, figure 2, col. 2, line 52 to col. 3, line 34; col. 5, line 8 to col. 6, line 38; and col. 9, lines 23 to 65 of Hosken. There has been no showing that Hosken '377 provides the necessary support for these and other portions of Hosken relied upon. The Examiner is again respectfully requested to provide the necessary showing of support for each and every portion of Hosken relied upon, or withdraw the rejection.

Although it has never formally been applied against the claims of the present application, the Office Action references portions of Hosken '377 as disclosing elements of the claims. It is respectfully pointed out that Hosken '377 must first be shown to be prior art to the claims of the present invention before it can be applied against the claims of the present application.

As was discussed in Applicants' previous remarks, while it is not applied against the claims of the present invention, Hosken '377 fails to teach, suggest or disclose scoring user logs, the scoring being responsive to a degree of occurrence of the at least one query item identifier in the user logs, so as to generate user logs score based exclusively on detected user item selections and the at least one query item. In addition, Hosken '377 fails to teach, suggest or disclose determining at least one result item responsive to a degree of occurrence in at least a subset of scored user logs, so as to discover at least one relationship based exclusively on detected user item selections and the at least one query item.

Hosken '377 describes a system for generating a music recommendation using predefined relationships established for content (i.e., artists, genres, and albums) and user-cluster relationships (i.e., clusters of users) to generate a combined content and collaborative recommendation. While Hosken '377 determines correlations in generating a collaborative recommendation, Hosken '377 does not provide any description of the process used to determine a correlation. Furthermore, Hosken '377 indicates that a correlation is performed using a user's favorites input table and a cluster table, and using two user profiles. However, both of the correlations performed in Hosken '377 involve tables which are not the same as a user log, which contains identifiers corresponding to detected user item selections. In addition, the correlations performed in Hosken '377 are not based exclusively on detected user item selections and the at least one query item.

Claim 1 (and the claims that depend from Claim 1) is therefore believed to be patentable over Hosken '377. Claims 39 and 59 (and the claims that depend from Claims 39 and 59) are also believed to be patentable over Hosken '377 for at least the same reasons.

Turning to independent Claims 34 and 93, among the features recited therein, is a feature of generating, based on a determined log likelihood ratio, a representation of a relationship between a first item and a second item based on implicit user behavior. Although it has not been applied against the claims, in view of the above discussion, Hosken '377 fails to show at least this feature of the claims.

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Response To Office Action

Docket No.: 85804 . 014501

Lazarus has been reviewed and nothing in the cited portions of Lazarus remedies the deficiencies noted above with respect to Hosken '377. Accordingly, Claims 34 and 93 (and the claims that depend from Claims 34 and 93) are believed to be in condition for allowance.

In view of the foregoing, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience. The Applicant respectfully requests that a timely Notice of Allowance therefore be issued in this case. Should matters remain which the Examiner believes could be resolved in a further telephone interview, the Examiner is requested to telephone the Applicant's undersigned attorney.

In this regard, Applicant's undersigned attorney may be reached by phone in California (Pacific Standard Time) at (714) 708-6500. All correspondence should continue to be directed to the below-listed address.

The Commissioner is hereby authorized to charge any required fee in connection with the submission of this paper, any additional fees which may be required, now or in the future, or credit any overpayment to Account No. 50-2638. Please ensure that the Attorney Docket Number is referenced when charging any payments or applying any credits for this application.

Respectfully submitted,

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